Agapanthida scutellaris.

A. oblonga, depressa, rufo-castanea, antennis pedibusque dilutioribus, supra confertim punctata, griseo variegata; scutello nigro, subscutiformi, in medio excavato; elytris apice paulo dehiscentibus, sutura canaliculata. Long. 4 lin.

Hab. Waikato.

Judging from Mr. White's figure of *A. pulchella* ('Voyage of the Erebus and Terror,' Entom. tab. 4. fig. 10), this species differs, it might be thought almost generically, in its shorter and much thicker femora. The derm in my unique example (apparently a female) seems to be covered with a membranous sort of integument, peeling off in patches; but, from the regularity on both sides, the variegation does not seem to be due solely to that cause. The slight intervals between the punctures on the elytra have a granulated appearance. *Agapanthida* differs from *Phlyctænodes* in its finely faceted eyes, an exceptional character in its own and allied groups.

Triplax Brounii.

T. obovata, fusco-castanea, nitida, antennis pedibusque ferrugineis, illis articulo ultimo apice obliquo, palpis maxillaribus articulo ultimo valde transverso; capite prothoraceque subtiliter, elytris fere obsolete punctatis; tibiis modice triangularibus; prosterno postice paulo bilobo. Long. $1\frac{3}{4}$ lin.

Hab. Auckland.

Rather narrower than *T. ænea*, and the elytra more cuneate. The nearly allied Australian genus *Thallis*, Er., has filiform palpi. I have named this interesting species after Captain Broun, whose numerous discoveries are adding so much to our knowledge of the insect-fauna of New Zealand.

VIII.—*Contributions to the Study of the chief Generic Types of the Palæozoic Corals.* By James Thomson, F.G.S., and H. Alleyne Nicholson, M.D., D.Sc., F.R.S.E., Professor of Natural History in the University of St. Andrews.

[Continued from vol. xvi. p. 429.]

[Plates VI. & VII.]

Genus Cyathophyllum.

Cyathophyllum, Goldfuss (in parte), Petref. Germ. vol. i. p. 54, 1826.

Gen. char. Corallum simple or compound, with a well-developed epitheca. Tabulæ not complete, but well developed and occupying a central area, which is surrounded by a more

or less extensive zone of vesicular tissue, composed of numerous rows of minute cells. Septa with their sides and edges smooth, always symmetrically developed and regularly arranged. No true columella is present; but the septa usually extend to the centre of the visceral chamber, where they partially coalesce or are twisted together, so as to form a small spurious columella projecting into the bottom of the calice.

The form of the corallum differs very much in different species of *Cyathophyllum*. In the simple forms the corallum is more or less of a conical or cylindro-conical figure, usually more or less bent or curved towards the base, and often with well-marked accretion-ridges. Good examples of these are to be found in *C. angustum*, Lonsd., *C. Murchisoni*, E. & H., *C. Stutchburyi*, E. & H., *C. Rœmeri*, E. & H., *C. ceratites*, Goldf., and *C. obtortum*, E. & H. The compound forms of *Cyathophyllum* assume very different aspects according to their mode of growth. Some, such as *C. articulatum*, Wahl., and *C. cæspitosum*, Goldf., form fasciculate masses, in which the corallites are long and cylindrical, and remain distinct from one another. Others, such as *C. truncatum*, Linn., and *C. paracida*, M'Coy (Pl. VII. fig. 7), exhibit the purest form of compound calicular gemmation, and form inverted pyramidal masses, the bases of which are formed by the parent corallite. Others, again, such as *C. hexagonum*, Goldf., *C. boloniense*, Blainv., *C. Sedgwickii*, E. & H., and *C. regium*, Phill. (Pl. VII. fig. 9), constitute astræiform masses, in which the corallites are generally firmly united laterally, and assume a polygonal form from mutual pressure. Finally, one species at any rate, viz. *C. helianthoides*, Goldf., appears to have been sometimes simple and sometimes compound. In the compound *Cyathophylla* calicine gemmation is the predominant mode of increase, though lateral gemmation obtains in some.

As regards their internal structure, the corals which are referable to the genus *Cyathophyllum* appear to be marked out with sufficient distinctness. The epitheca is generally thin, but well developed, and marked with fine concentric striæ and more or less conspicuous annulations of growth. Very often there are vertical lines or ridges corresponding with the septa within; and these are very conspicuous in some forms, as, for example, in *C. angustum*, Lonsd., and *C. bisectum*, Lindström.

The tabulæ never extend completely across the visceral chamber, as they do in *Zaphrentis* and *Amplexus*, but are always confined to a zone or area occupying the centre of the coral. This tabulate area is sometimes very extensive, at other times more or less contracted; and within it the tabulæ are usually very closely set, often bifurcating and coalescing with their neighbours (Pl. VI. fig. 1, & Pl. VII. figs. 7 A, 9 A).

The central tabulate area of the coral is, in all forms properly referable to *Cyathophyllum*, surrounded by an exterior zone of finely vesicular tissue. This forms the periphery of the visceral chamber, and is composed of numerous layers of minute lenticular cells, which are invariably inclined upwards and outwards as regards the axis of the coral (Pl. VI. fig. 1 A, & Pl. VII. figs. 7 A, 9 A).

The septa are well developed, symmetrical, regularly arranged, and not interrupted in general by the development of any conspicuous fossula. Secondary septa may or may not be present. In the outer portion of the coral the interseptal loculi are more or less copiously filled up by dissepiments, which form the vesicular tissue above spoken of, and have their convex surfaces directed upwards. The sides of the septa are plain, and their free edges are not denticulated as they are in the genus *Heliophyllum*. At the bottom of the calice the septa generally extend inward to the centre of the visceral chambers, where they are usually twisted together so as to form a small projection or false columella. In almost all the typical forms of the genus a similar meeting of the septa in the centre of the corallum is shown in transverse sections of the coral at all heights (Pl. VII. figs. 8 & 9). In some forms, however, which are not otherwise separable from *Cyathophyllum*, and which appear properly to belong to it, transverse sections exhibit the septa stopping short at some distance from the centre, and leaving the tabulæ exposed to view over a larger or smaller median area (as in *C. paracida*, M'Coy, Pl. VII. fig. 7 B).

It will be seen from the above that the structural characters which collectively distinguish the genus *Cyathophyllum* are:—(1) the presence of a more or less extensive central tabulate area; (2) the existence of an exterior zone of vesicular tissue, formed by oblique dissepiments, the convexities of which are directed upwards; (3) the more or less completely developed, symmetrical, and plain septa; (4) the general twisting together or union of the septa in the centre of the floor of the calice, constituting a false columellar projection.

With regard to the affinities of the genus, its nearest ally appears to be *Diphyphyllum*, Lonsd. Some forms of *Cyathophyllum*, indeed, such as *C. cæspitosum*, Goldf., appear to establish an almost complete transition between the two genera. As a general rule, however, the genus *Diphyphyllum* can be readily distinguished by the fact that the septa appear never to extend quite to the centre of the visceral chamber, but invariably leave a well-defined central tabulate area into which the septa are not prolonged. There is thus no twisting to-

gether of the septa in the centre of the corallites to form a false columella. The genus *Eridophyllum*, E. & H., is similarly distinguished from the true *Cyathophylla*, with the additional character that adjacent corallites are united together by epithecal processes. In the genus *Fascicularia** of Dybowski, however, the septa are said to extend quite to the centre of the visceral chamber, where they come into contact with one another; and it is difficult to see how these can be generically separated from forms like *C. cæspitosum*, Goldf. The genus *Donacophyllum* of the same author appears to be hardly separable from *Diphyphyllum*, the only difference which is stated to exist being in the size of the vesicles of the dissepimental area (Mon. der Zoanth. scleroderm. rugosa aus der Silurformation Esthlands &c., p. 80).

If, on the other hand, we take the simple forms of *Cyathophyllum*, we find few genera so closely related thereto as to afford any great difficulty in diagnosis. From *Zaphrentis* proper the simple *Cyathophylla* are at once distinguished by the incompleteness of the tabulæ, the presence of an exterior zone of vesicular tissue, and the possession by the latter of a well-marked fossula, formed by the folding and coalescence of a certain number of the septa.

The genus *Campophyllum*, E. & H. (Pl. VI. figs. 3, 4, 4 A), offers, again, a transitional form between the simple *Cyathophylla* and the genus *Amplexus*. It agrees with the former in having the tabulæ restricted to a central area, and in the presence of an exterior zone of vesicular tissue; whilst it approximates to the latter in the fact that the septa do not nearly reach the centre of the visceral chamber, but leave the tabulæ exposed over an extensive median space.

The genus *Calophyllum*, Dana (Pl. VI. figs. 5–7 A), whether valid or not, is fundamentally separated from *Cyathophyllum* by the fact that it possesses no circumferential zone of vesicular tissue, and by its complete tabulæ. Whether or not *Calophyllum* is distinct from *Amplexus*, as denied by Edwards and Haime (Pol. Foss. des Terr. Pal. p. 347), and affirmed by M'Coy (Brit. Pal. Foss. p. 91), and more recently by Dybowski (Mon. der Zoanth. scler. rugosa, p. 118), can hardly be settled except by a reference to the forms originally examined by the great American naturalist when founding the genus.

Our examination of the corals of the genus *Streptelasma*, Hall, has not yet proceeded far enough to justify us in speaking positively as to its affinities. Whatever its true position may

* This name will have to be abandoned, having been previously applied by Milne-Edwards to a well-known genus of Polyzoa.

be, however, it is clearly separated from *Cyathophyllum* by the absence of any external area of vesicular tissue.

The genus *Heliophyllum*, Hall, though in certain respects nearly allied to *Cyathophyllum*, and appearing in great part to take its place in certain formations, is nevertheless distinguished by characters of primary importance. It agrees with *Cyathophyllum* in possessing a circumscribed central tabulate area, in the extension of the septa to the centre of the visceral chamber (where they are more or less twisted and coalescent), and in the fact that the circumferential zone of the corallum is more or less minutely subdivided into cells by the development of dissepiments in the interseptal loculi. With these substantial points of agreement, there is the following striking dissimilarity of structure:—In *Cyathophyllum* the lines of dissepiments run from the theca *inwards and downwards*, so as to form a series of layers of minute vesicles having a corresponding inclination. In *Heliophyllum*, on the other hand, the interseptal loculi are divided into compartments by the intersection of two sets of dissepiments, of which the primary and far most conspicuous series is directed from the internal surface of the wall obliquely *inwards and upwards*, towards the centre, in a succession of ascending arches, the convexities of which are directed upwards. The dissepiments of this series appear on the free edges of the septa within the calice as so many short spines; and they communicate to the sides of the septa, as seen in transverse sections, a characteristic and unmistakable denticulation. They are intersected, generally nearly at right angles, by a second series of dissepiments, which are much more delicate, more disconnected, and more variable than the preceding, but which generally run inwards and downwards from the wall.

The genus *Omphyma*, Rafinesque and Clifford, is, again, related to *Cyathophyllum*, the central tabulate area being surrounded by an outer zone of large vesicles having an upward and outward direction. It is, however, distinguished by the fact that the septa do not coalesce centrally, but leave a small portion of the tabulæ free to view, by the presence of four shallow septal fossulæ, by the possession of root-like outgrowths of the epitheca, and by the comparatively gigantic size of the vesicles filling the outer portion of the interseptal loculi.

Finally, we may briefly consider the forms which have been at various times placed under the names *Caninia* and *Cyathopsis*. Most of the forms included under the genus *Caninia*, Mich., have been shown by Milne-Edwards and Haime to appertain in reality to *Zaphrentis*. This is the case, more

or less certainly, with *C. patula*, Mich., *C. cornu-copiæ*, Mich., *C. punctata*, D'Orb., *C. ibicina*, Lonsd., and *C. bilateralis*, Hall; whilst *C. cornu-bovis*, Mich., is apparently an *Amplexus*, and *C. sulcata*, D'Orb., is an *Aulacophyllum*. These distinguished authorities, therefore, consider that *Caninia*, Mich., is but a synonym of the previously founded *Zaphrentis* of Rafinesque and Clifford; and in this opinion they have been generally followed.

Prof. M'Coy, on the other hand, came to the conclusion that *Caninia* could be separated from *Zaphrentis* by the possession of a circumferential zone of vesicular tissue; but his conclusion was vitiated by the fact that he included under this name forms of very diverse nature. Thus his *C. turbinata* and *C. lata* are referable to *Omphyma*; whilst his *C. subibicina* appears to be a *Zaphrentis*.

The genus *Cyathopsis*, D'Orb., again, was considered by Milne-Edwards and Haime as synonymous with *Amplexus*; but it was retained as distinct by M'Coy, who placed under it *C. cornu-bovis*, Mich. (Pl. VII. figs. 6, 6 A), which is probably an *Amplexus*, together with *C. cornu-copiæ*, Mich., and *C. fungites*, M'Coy, both of which belong to *Zaphrentis*. According to M'Coy's definition, *Cyathopsis*, D'Orb., is distinguished by not having the exterior zone of vesicular tissue which is present in *Caninia*; whilst it is said to differ from *Amplexus* chiefly in the more vesicular nature of the tabulæ, and the greater inward extension of the septa.

More recently Dybowski (*op. jam cit.*) has declared in favour of retaining both *Caninia* and *Cyathopsis*. He places *Caninia* in the immediate neighbourhood of *Omphyma*, from which it is separated, in his opinion, solely by the fact that it possesses but a single septal fossula, whilst four such exist in the latter. He also retains *Cyathopsis*, D'Orb. (as distinct from *Amplexus*), and places it next to *Zaphrentis*, from which he separates it simply by the smaller development of the septa. According to his views, *Zaphrentis* and *Cyathopsis* agree with one another in having septa of unequal lengths and of irregular arrangement; whereas he places *Amplexus* in a different family, as having equal and regularly arranged septa. We, however, do not think that any difference in the extent to which the septa are developed should, of itself, be regarded as of such high value in classification; nor can we admit, as a matter of fact, that the septa in the genus *Amplexus* are always equally developed.

Upon the whole * there can be little hesitation about con-

* Whether *Cyathopsis*, D'Orb., can be retained as a distinct genus or not depends, of course, upon the characters possessed by the form which

sidering *Cyathopsis* a synonym of *Amplexus*, as insisted on by Edwards and Haime. The same authorities can equally be followed in referring most of the species of *Caninia* to the genus *Zaphrentis*.

There is, however, one species of *Caninia*, viz. the *Caninia gigantea* of Michelin, which, in our opinion, cannot possibly be referred to *Zaphrentis* without violating its natural affinities. This species was removed from *Caninia* to *Zaphrentis* by Milne-Edwards and Haime; and its name was at the same time changed to *Z. cylindrica*, in consequence of there being already in existence the much older *Z. gigantea* of Lesueur, which is an unquestionable *Zaphrentis*. We are, however, satisfied that the coral known under the names of *C. gigantea*, Mich., or *Z. cylindrica*, E. & H., possesses a structure which removes it out of *Zaphrentis* proper, as will at once be evident from the following brief summary of its leading characters:—

Corallum (Pl. VI. figs. 1–1 I) tall, cylindrical or cylindro-conical, more or less curved, with distinct accretion-swellings. Epitheca thin, with fine encircling lines of growth. Calice circular and shallow. The central area of the coral is occupied exclusively by the tabulæ, which are close-set and numerous, and bend down slightly at the margins of the area. Circumferentially there is a large, distinct, and well-developed zone of vesicular tissue, formed by dissepiments filling the interseptal loculi, and constituting a series of minute lenticular cells arranged in rows which have a direction upwards and outwards. The septa are well developed, but do not appear to extend to the centre of the visceral chamber, a portion of the central tabulate area being left exposed to view. The primary septa are numerous, apparently always over sixty in number towards the summit of the corallum, and they alternate with much shorter secondary septa. A single well-marked septal fossette is present, placed on one side, formed by a depression of the tabulæ, and occupied by a single short septum.

D'Orbigny selected as the type of the genus, viz. *Cyathopsis* (*Amplexus*) *cornu-bovis*, Mich. This coral differs from typical species of the older genus *Amplexus* (such as *A. coralloides*, Sow.) chiefly in the fact that the septa extend further inwards towards the centre of the visceral chamber. The distinction relied upon by D'Orbigny is that *A. cornu-bovis* possesses a septal fossette formed by an inflection of the tabulæ on one side; but a similar, though less pronounced, fossette is present in *A. coralloides*; so that this distinction falls to the ground. The development of the septa in *A. cornu-bovis*, though greater than in *A. coralloides*, is not sufficient to constitute a ground of generic distinction, since in both forms a large central area of the tabulæ is left exposed to view. We have not seen the original specimens of *A. cornu-bovis*, Mich.; but we figure an example, apparently belonging to this species (Pl. VII. figs. 6, 6 A), which shows the characters of the septa, and can be compared with the figures we have previously given of *Amplexus*.

When we consider the above-mentioned characters as displayed by longitudinal and transverse sections of this coral (Pl. VI. figs. 1–1 I), we are led to the conclusion that it is fundamentally distinguished from all the forms of *Zaphrentis* proper (1) by the fact that the tabulæ do not extend completely across the visceral chamber, (2) by its possession of an exterior vesicular zone, formed by very numerous dissepiments filling the interseptal loculi, and (3) by the fact that the septal fossula is not formed by the bending round and coalescence of a certain number of the septa, but is constituted by a funnel-shaped depression of each successive tabula (whence the name of *Siphonophyllia* applied by Scouler to forms presenting this peculiarity).

On the other hand, it agrees with the genus *Cyathophyllum*, as we have defined it, (1) in the fact that the tabulæ are restricted to a central area, and (2) in the possession of a well-marked circumferential zone of lenticular cells, which are arranged in layers inclined upwards and outwards. In the possession of a well-marked fossula, on the contrary, it certainly differs from the more typical simple *Cyathophylla*, though some of these do actually possess a small or rudimentary fossette. A more serious difference, however, is found in the fact that the septa do not appear to reach the centre of the visceral chamber, but fall short of this point, and leave the tabulæ exposed. This, at any rate, is what is shown by transverse sections (Pl. VI. figs. 1 B–1 I), though, according to Edwards and Haime, the septa are continued in the form of striæ nearly to the centre of the highest of the tabulæ *.

So far as the evidence in our possession goes, we have no doubt as to the propriety of removing *Z. cylindrica* from the genus *Zaphrentis*; and we are inclined to think that it should be placed in *Cyathophyllum*, in spite of the minor differences above noted. In that case the original specific name will have to be restored, and it will stand as *Cyathophyllum giganteum*, Mich. If the above-mentioned differences should be considered of sufficient weight to separate it generically from *Cyathophyllum*, then the genus *Caninia* will have to be resuscitated for its reception, and it will revert to its original title of *Caninia gigantea*, Mich.

The genus *Cyathophyllum* has a wide range in time, ex-

* Much stress cannot perhaps be laid upon the fact that the septa fall short of the centre. It is true that in the most typical *Cyathophylla* they extend to the centre of the visceral chamber; but there is at least one marked exception to this rule, viz. *C. paracida*, M'Coy (Pl. VII. figs. 7 B, 7 C), in which the septa fall short of the centre, and leave the tabulæ exposed to view in the centre.

tending from the Upper Silurian (Wenlock Limestone) to the top of the Lower Carboniferous. It appears to have attained its maximum of development in the Devonian period.

Genus Campophyllum.

Campophyllum, Milne-Edwards and Haime, Brit. Foss. Cor., Intr. p. lxviii. (1850).

Gen. char. Corallum simple, conical or cylindro-conical, with an epitheca. Calice deep. Tabulæ well developed, extending over a large central area, but not quite reaching the inner surface of the theca. Outside the tabulate area is a zone of vesicular tissue; but this is mostly of inconsiderable thickness. The septa are short, and do not nearly extend to the centre, but leave the smooth upper surfaces of the tabulæ exposed over a large median space. At the circumference of the visceral chamber the interseptal loculi are occupied by delicate dissepiments (Pl. VI. figs. 3, 4, & 4 a).

As we have remarked before, the genus *Campophyllum* may be regarded as intermediate between the simple *Cyathophylla* and *Amplexus*. The point in which the genus approaches *Cyathophyllum* is found in the fact that the interseptal loculi are filled up externally by fine dissepiments, which give rise to a peripheral zone of vesicular tissue, in which the vesicles are arranged in layers directed upwards and outwards. This vesicular zone, however, is very rarely developed to any thing like the extent which characterizes *Cyathophyllum*; and it is often filled up and almost unrecognizable. From the typical *Cyathophylla*, again, the genus is separated by the much less highly developed condition of the septa, and the exposure of the tabulæ to view over a large central area. In this latter feature, on the other hand, the genus closely approaches *Amplexus*.

The tabulæ are comparatively remote and simple; and the area which they occupy is sometimes so great as to render the distinction of examples from *Amplexus* a matter of difficulty. The septa, though short, are always longer than in most of the species of *Amplexus*, and they are united towards the circumference by a moderate number of dissepiments. The dissepimental vesicles are small and lenticular in shape. A septal fossula is present, in some instances at any rate, and is formed by a depression of the tabulæ on one side of the corallum (Pl. VI. fig. 3). Short secondary septa are developed alternately with the primary septa.

In the absence of any certainty as to the precise forms included by Prof. Dana in his genus *Calophyllum*, we are in

doubt as to whether it may not be in part conterminous with *Campophyllum* as well as with *Amplexus*. The forms recently referred to *Calophyllum* by Dybowski (Mon. der Zoanth. scler. rugosa, pp. 118–121) are partly simple and partly compound, and are certainly not referable either to *Campophyllum* or *Amplexus*. We have, however, no means of judging to what extent they can be regarded as representing the forms referred by Dana to *Calophyllum*. There exists, however, in the Carboniferous rocks of Scotland, a group of corals which stand intermediate between *Campophyllum* on the one hand and *Amplexus* on the other. They differ from the former in having no well-defined exterior zone of vesicular tissue, and from the latter in the much greater development of the septa, which only leave a small central area of the tabulæ exposed. Whether the name of *Calophyllum* can with propriety be retained for such forms we leave at present an open question; but we have figured a few examples for purposes of comparison.

As at present constituted the genus *Campophyllum* contains only simple corals. There would, however, be some reason for removing *Cyathophyllum paracida*, M'Coy, from its present genus, and referring it to *Campophyllum*, as suggested by Milne-Edwards and Haime (Pol. Foss. des Terr. Pal. p. 395). The ground for such a change is that the septa in this species appear never to reach the centre of the visceral chamber, but always leave a portion of the tabulæ exposed; whereas in the typical *Cyathophylla* the septa meet in the centre. If this change were to be accepted, then *Campophyllum* would contain compound as well as simple forms. *Cyathophyllum giganteum* (=*Zaphrentis cylindrica*) would also have to undergo a similar transference. We do not, however, feel justified in adopting this alteration with the evidence at present in our possession.

The genus *Campophyllum* is mainly Devonian in its range; but it also extends into the Carboniferous system, where it is represented by at least one species (*Campophyllum Murchisoni*, E. & H., Pl. VI. figs. 3, 4, & 4 A).

EXPLANATION OF THE PLATES.

(All the specimens are figured of the natural size.)

Plate VI.

Fig. 1. *Cyathophyllum* (*Canina*) *giganteum*, Mich., outline of the corallum of a large individual, from Auchenskeoch Quarry, near Dalry, Ayrshire (Lower Carboniferous); 1 A, longitudinal section of the upper portion of another individual of the same, from the Lower Carboniferous of Pathgate, Linlithgowshire; 1 B–1 I,

transverse sections of the same, showing the structure at different stages of growth.

Fig. 2. Transverse section of another example of the same, Lower Carboniferous, Brockley, near Lesmahagow, Lanarkshire.

Fig. 3. Transverse section of *Campophyllum Murchisoni*, E. & H., Lower Carboniferous, Durnish, County Limerick. (In the collection of the Geological Survey of Ireland.)

Figs. 4, 4 A. Longitudinal and transverse sections of another example of the same, Lower Carboniferous, near Beith, Ayrshire. In all these examples the narrow outer vesicular zone is more or less completely filled up.

Figs. 5, 5 A, 6, 6 A, 7, 7 A. Longitudinal and transverse sections of different examples of a coral possibly belonging to *Calophyllum*, Dana. The structure is nearly allied to that of *Campophyllum*; but there is an absence of any exterior zone of vesicular tissue. The specimens are from the Lower Carboniferous of Ayrshire.

PLATE VII.

Figs. 1, 2, & 3. Transverse sections of a large species of *Cyathophyllum*, closely allied to *C. giganteum*, Mich., but differing in the nature of the dissepiments, the number of the septa, and certain other particulars. The specimens exhibit a large septal fossula. Lower Carboniferous, Ireland. (In the Collection of the Geological Survey of Ireland.)

Figs. 4 & 5. Transverse sections of *Cyathophyllum*, sp., exhibiting fissiparous development. Lower Carboniferous, Brockley, near Lesmahagow, Lanarkshire.

Figs. 6, 6 A. *Amplexus* (*Cyathopsis*) *cornu-bovis*, Mich., showing the septa passing inwards to near the centre of the visceral chamber. Lower Carboniferous, Ayrshire.

Fig. 7. *Cyathophyllum paracida*, M'Coy, showing calicular gemmation; 7 A, longitudinal section of the same; 7 B–7 D, transverse sections of the same. Lower Carboniferous, Lanarkshire.

Fig. 8. *Cyathophyllum*, sp., transverse section. Carboniferous, Ireland. (In the collection of the Geological Survey of Ireland.)

Fig. 9. *Cyathophyllum regium*, Phill., transverse section of a small slab; 9 A, longitudinal section of a single corallite of the same.

[To be continued.]

IX.—*Descriptions of two new Coleopterous Insects belonging to the Families* Buprestidæ *and* Melolonthidæ. By CHARLES O. WATERHOUSE.

Fam. **Buprestidæ.**

Stigmodera Saundersii, sp. n.

Oblonga, convexa, lata, nitida, viridi-cærulea; elytris cyaneis, maculis quatuor coccineis; thorace convexo, longitudine $\frac{2}{7}$ latiori, fortiter crebre punctato; scutello parvo, nitido; elytris thorace vix latioribus, at $2\frac{1}{5}$ longioribus (apicibus rotundatis), punctato-striatis. Long. 8 lin., lat. $3\frac{4}{5}$ lin.

This species is peculiar for its broad, very convex form, and